

WHAT IS CLAIMED IS:

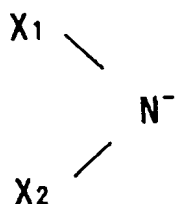
1. A polymeric-type antistatic agent comprising:

a polymer composition containing a polymeric-type charge prevention agent containing a resin or/and an elastomer as a main component thereof; or/and a thermoplastic resin having a polar group or/and an elastomer having said polar group; and

an anion-containing salt, having a fluoro group and a sulfonyl group, which is added dispersedly in said polymer composition without intermediary of a medium consisting of a low-molecular-weight polyether-containing compound or low-molecular-weight polar compound whose number-average molecular weight is not more than 5000.

2. The polymeric-type antistatic agent according to claim 1, wherein said anion-containing salt having said fluoro group and said sulfonyl group is a salt having at least one kind of an anion selected from among chemical formulas 1 through 3 shown below.

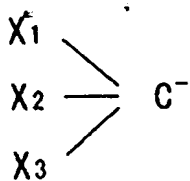
chemical formula 1



chemical formula 2



chemical formula 3



where  $X_1$ ,  $X_2$ , and  $X_3$  denote functional groups containing C, -F, and -SO<sub>2</sub>- and having one to eight carbon atoms.

3. The polymeric-type antistatic agent according to claim 1, wherein not less than 0.01 parts by weight nor more than 20 parts by weight of said anion-containing salt having said fluoro group and said sulfonyl group is added to total 100 parts by weight of an entire thermoplastic resin or/and an entire elastomer of said polymer composition.

4. The polymeric-type antistatic agent according to claim 1, wherein said polymer composition contains at least one kind of a copolymer selected from among a group of a polyether block polyolefin copolymer or a polyoxyalkylene copolymer.

5. The polymeric-type antistatic agent according to claim 2, wherein said anion-containing salt consists of a salt having at least one kind of an anion selected from among a group of a bis (fluoroalkylsulfonyl) imide ion, a fluoroalkylsulfonic acid ion, and a tris (fluoroalkylsulfonyl) methide ion.

6. The polymeric-type antistatic agent according to claim 1, wherein said anion-containing salt is a salt having a cation of any one of alkali metals, group 2A metals,

transition metals, and amphoteric metals and an anion having a fluoro group and a sulfonyl group.

7. The polymeric-type antistatic agent according to claim 6, wherein said anion-containing salt is a salt selected from among a group of an alkali metal salt of bis (trifluoromethanesulfonyl) imide, an alkali metal salt of tris (trifluoromethanesulfonyl) methide, and an alkali metal salt of trifluoromethanesulfonic acid.

8. An antistatic polymer composition containing not less than 0.1 parts by weight nor more than 65 parts by weight of a polymeric-type antistatic agent, according to claim 1, added to total 100 parts by weight of said one or more kinds of polymers selected from among a group of a thermoplastic polymer, a thermoplastic elastomer, and an unvulcanized rubber.

9. The antistatic polymer composition according to claim 8, wherein a crosslinkable rubber or/and a thermoplastic elastomer dispersed by dynamic crosslinking are used as said polymer.

10. The antistatic polymer composition according to claim 9, wherein a compound (B) containing a rubber component whose main component is EPDM is dispersed by dynamic crosslinking in a compound (A) containing a styrene thermoplastic elastomer as a main component thereof.

11. The antistatic polymer composition according to claim 10, wherein said compound (A) contains not less than 15

parts by weight nor more than 500 parts by weight of a softener and not less than one part by weight nor more than 50 parts by weight of a resin containing an olefin resin as a main component thereof for 100 parts by weight of said rubber component; and

said compound (B) contains not less than 15 parts by weight nor more than 600 parts by weight of a softener for 100 parts by weight of said rubber component.

12. A method of manufacturing an antistatic polymer composition containing a first component consisting of an anion-containing salt having a fluoro group and a sulfonyl group, a second component consisting of a polymer composition containing a polymeric-type charge prevention agent or/and a thermoplastic resin having a polar group or/and an elastomer having said polar group, and a third component consisting of a composition containing one or more kinds of polymers selected from among a group of a thermoplastic polymer, a thermoplastic elastomer, and an unvulcanized rubber,

said manufacturing method being carried out by selecting any one of:

mixing and kneading said first component, said second component, and said third component all together;

adding said first component to a composition obtained by preparing said second component, kneading or blending said first component and said composition, and mixing an obtained

composition with said third component and kneading said composition and said third component;

adding said first component to a composition obtained by kneading or mixing a composition obtained by preparing said  
5 second component with a composition obtained by preparing said third component; and kneading said first component and said composition consisting of said second component and said third component.

13. The method according to claim 12, comprising the  
10 steps of:

dispersing a crosslinkable rubber or/and a thermoplastic elastomer in a thermoplastic resin or/and a thermoplastic elastomer by dynamic crosslinking by an extruder or a kneader to obtain a composition;

15 adding a kneaded polymeric-type antistatic agent according to claim 1 to said composition obtained by said dynamic crosslinking with said composition being kneaded by said extruder or said kneader.

14. The polymeric-type antistatic agent according to  
20 claim 1, containing a polymer having a cyano group at not less than 20 parts by weight of an entire polymer component of said polymeric-type antistatic agent.

15. The antistatic polymer composition according to claim 8, containing a polymer having a cyano group at not less  
25 than 20 parts by weight of an entire polymer component of said

antistatic polymer composition.

16. The polymeric-type antistatic agent according to claim 14, wherein said polymer having said cyano group consists of one or more rubbers selected among a group of  
5 acrylonitrile butadiene rubber, hydrogenated acrylonitrile butadiene rubber, carboxylic acrylonitrile butadiene rubber, acrylonitrile butadiene-isoprene rubber (NBIR), liquid nitrile rubber, and latices of said rubbers.

17. The antistatic polymer composition according to  
10 claim 15, wherein said polymer having said cyano group is of a low-nitrile type in which a central value of a content of acrylonitrile is not more than 24 wt%.

18. The antistatic polymer composition according to claim 8, wherein said anion-containing salt is mixed with said  
15 polymer having said cyano group to form a master batch.

19. The polymeric-type antistatic agent according to claim 14, wherein said anion-containing salt is mixed with said polymer having said cyano group to form a master batch.

20. The antistatic polymer composition according to  
20 claim 18, wherein a content of said anion-containing salt contained in said master batch is not less than one wt% nor more than 40 wt%.

21. A method of manufacturing an antistatic polymer composition, comprising the steps of:

25 forming a master batch containing said anion-containing

salt at said wt% specified in claim 20; and

setting said content of said anion-containing salt to said content specified in claim 15 for a weight of an entire polymer component of said antistatic polymer composition by  
5 using said master batch.

22. The antistatic polymer composition according to claim 8, comprising:

a low-polar polymer composition consisting of any one of an olefin resin, an olefin thermoplastic elastomer, and a  
10 styrene thermoplastic elastomer or a mixture of said olefin resin, said olefin thermoplastic elastomer, and said styrene thermoplastic elastomer; and

a polymer having an ester structure.

23. The antistatic polymer composition according to  
15 claim 22, containing not less than one part by weight nor more than 40 parts by weight of said polymer having said ester structure and not less than 0.01 nor more than 20 parts by weight of said anion-containing salt specified by said chemical formulas 1 through 3 for 100 parts by weight of said  
20 low-polar polymer composition.

24. The antistatic polymer composition according to claim 22, wherein said olefin resin consists of polypropylene or polyethylene;

said olefin thermoplastic elastomer consists of rubber  
25 and polyolefin in which said rubber dynamically crosslinked

with a crosslinking agent is dispersed; and

said styrene thermoplastic elastomer consists of rubber and styrene thermoplastic elastomer in which said rubber dynamically crosslinked with a crosslinking agent is dispersed.

5        25. The antistatic polymer composition according to claim 22, containing said salt with intermediary of polyether block polyolefin.

26. The antistatic polymer composition according to claim 8, having a permanent compression set not more than 30%  
10 when said permanent compression set is measured at a temperature of 70°C for 22 to 24 hours at a permanent compression rate of 25% in accordance with Permanent set testing methods for rubber, vulcanized or thermoplastic specified in JIS K6262; and a volume resistivity not more than  
15  $10^{11.0}(\Omega \cdot \text{cm})$  or/and a surface resistivity not more than  $10^{11.0}(\Omega)$ , when said volume resistivity or/and said surface resistivity are measured at a temperature of 23°C and a relative humidity of 55% with a voltage of 1000 applied thereto in accordance with the method specified in JIS K6911.

20        27. A product composed of an antistatic polymer composition according to claim 8.

28. Rubber products composed of an antistatic polymer composition according to claim 15 and used as a shoe sole, an adhesive agent, a fuel hose, a hose such as an oil-resistant  
25 hose, an oil seal, a packing, a gasket, a diaphragm, a fiber-



processing roller, a textile roller, gloves, a printing roller, and a rubber blanket for printing.

29. The products, according to claim 27, belonging to a group of a conductive roller, a conductive belt, a paper-  
5 feeding roller, and a paper-feeding belt all for use in an image-forming apparatus.

30. An image-forming apparatus using said products according to claim 29.